State Fleet Efficiency and Alternative Fuels Program Model Plan

RSMo 414.400-414.417

Department of Natural Resources
Energy Center

2002

This manual was prepared with the support of the U.S. Department of Energy (DOE). Any opinions, findings, conclusions or recommendations expressed in this document are those of the authors and do not necessarily reflect the views of DOE.

Table of Contents

CHAPTER I

OVERVIEW

I. What is the intent of Missouri RSMo Sections 414.400-414.417?

A. Reduce fuel consumption by state-owned vehicles
B. Improve fleet management
C. Promote the use of alternative fuels

II. Who is affected by fleet energy conservation requirements of Missouri RSMo Sections 414.400-414.417?

A. All state agencies

III. Vehicle fleet energy conservation plans should include:

A. A timetable by which fleet vehicles will be replaced with vehicles that exceed the average fuel economy for their class. State statutes require overall vehicle fleet fuel efficiency for each agency to meet or exceed the Corporate Average Fuel Economy (CAFE) standards. With few exceptions the statute also requires all vehicles purchased for state fleets to meet CAFE standards.
B. Options for the use of technologies that promote energy conservation and reduced fuel consumption
C. Procedures that promote efficient trip planning and state vehicle use
D. Carpooling and vanpooling for agency employees for commuting and job-related travel

IV. Reporting requirements for state fleet energy conservation planning include, but are not limited to:

A. Annual fuel consumption for both conventional and alternative fuels
B. Number of vehicles
C. Vehicle miles traveled
D. Annual fuel costs
E. Annual maintenance costs
F. Average fleet fuel economy and estimated cost savings for conventional and alternative fuel vehicles will be calculated based on data supplied by state agencies

V. Who is affected by the alternative fuel vehicle acquisition requirements of Missouri RSMo Sections 414.400-414.417?

State agencies with more than 15 motor vehicles must acquire vehicles capable of using alternative fuels as follows:

- At least 50 percent of the agency's fleet vehicles acquired between July 1, 1998, and July 1, 2000, and each biennial period thereafter.
- It is required that at least 30 percent of all motor fuel purchased annually for use in alternative fuel vehicles, calculated in gasoline gallon equivalents, be alternative fuel.

VI. What does the term "alternative fuel" include?

A. Compressed Natural Gas (CNG)
B. Liquified Natural Gas (LNG)

C. Liquified Petroleum Gas or Propane (LPG)
D. Methanol (M-85%)
E. Ethanol (E-85%)
F. Electricity
G. Hydrogen
H. Biodiesel (B20)

VII. Alternative fuel use plans should include:

A. Identify vehicle types
   1. Range
   2. Specialty uses
   3. Fuel availability
   4. Vehicle cost
   5. Vehicle manufacturing and conversion capability
   6. Safety
   7. Resale values
   8. Vehicle life
   9. Vehicle maintenance costs

B. Alternative fuel considerations
   1. Vehicle exhaust emissions
   2. Fuel efficiency
   3. Fuel production efficiency
   4. Air emission characteristics (associated with production)
   5. Best fuels for energy conservation and emissions reduction
   6. Vehicle maintenance costs

VIII. Reporting requirements for the acquisition and use of AFV's by state agencies include:

A. Types and amounts of alternative fuels used
B. Number of miles traveled using alternative and conventional fuels, and the ratios to the total number of miles traveled
C. Number of vehicles owned that were purchased or converted to run using alternative fuels

IX. Documents to be submitted to the Department of Natural Resources include:

A. Fleet energy conservation plan
B. AFV acquisition and alternative fuel use plan
C. Annual fuel report

CHAPTER II

STATE FLEET ENERGY CONSERVATION PLANS

Overview and Elements of Plan Development

Overview

Under sections 414.400-414.417, RSMo 1999, state agencies are required to meet minimum guidelines for efficient fleet management. To achieve this, state agencies are required to develop and implement vehicle fleet energy conservation plans. These plans must include:

- √ A timetable by which fleet vehicles will be replaced with vehicles that exceed the average fuel economy for their class. State statutes require overall vehicle fleet fuel efficiency for each agency to meet or exceed the Corporate Average Fuel Economy (CAFE) standards. With few exceptions the statute also requires all vehicles purchased for state fleets to meet CAFE standards.

- √ The use of demonstrated innovative technologies that promote energy efficiency and reduced fuel consumption;

- √ Methods to promote efficient trip planning and vehicle use; and

- √ Carpooling and vanpooling for agency employees.

State agencies are to implement these and other fleet efficiency programs and report results each year to the Missouri Department of Natural Resources (DNR), Energy Center. Information from the agency plans and progress reports will be compiled by the DNR Energy Center to communicate state fleet energy conservation plans and progress to the state legislature and private sector.

This legislation offers great opportunities for state agencies to stretch operating budgets through greater fleet efficiency and, simultaneously, to take a lead in demonstrating technologies for reducing fuel consumption and managing travel efficiently. It also offers an arena for enhancing fruitful interagency communication and cooperation.

Background

Transportation is a major consumer of energy in Missouri, accounting for about one-third of the energy consumed in the state. High gasoline prices during the summers of 2000 and 2001 reminded us of the importance of fuel efficiency and increased the use of alternative fuels.

Opportunities to conserve energy are particularly promising in work-related travel. Recent national statistics indicate that:

- Almost 28 percent of all vehicle trips are made for work-related purposes.
- These trips tend to be comparatively long (averaging 10.9 miles each for work trips and 14 miles each for work-related business trips).
- Such trips represent a sizable percentage (about 36 percent) of all vehicle miles traveled within the United States each year.

This document will assist state agencies in planning to conserve energy in work-related travel.

Benefits

The Fleet Energy Conservation Plan is an attempt to enhance the efforts of state agencies in applying fuel-reduction strategies to the management of the state fleet. Benefits to the state from the program include the following:

- Reduction in state dependence on energy sources that are not produced domestically and, therefore, must be imported.
- Reduction in emissions resulting from fuel consumption. This is particularly pertinent in areas with air quality problems, such as St. Louis and Kansas City.
- Improvements in fleet fuel economy through vehicle purchases that meet or exceed the Corporate Average Fuel Economy (CAFE) standards. This conserves natural resources.
- Reduction in public funds spent on fuel costs.
- Demonstration of innovative technologies that promote energy conservation and reduce fuel consumption.
- An increase in the use of carpooling and vanpooling for agency employees.

Elements of plan development

Elements of plan development include compilation of fleet information and determination of vehicles to be included in the plan, formulation of goals, formulation of strategies, ranking of strategies, implementation, and monitoring and evaluation of results.

1. Compiling information and determining vehicles: Compiling and reviewing current fleet information provides the basis for analyzing energy use in the current fleet and determines the most effective fleet efficiency strategies to accomplish the

requirements of the Missouri law. The agency should classify the vehicles in its fleet based on the classifications provided by the DNR Energy Center.

The agency should compile and review other fleet information such as:

- Fuel consumption and fuel and maintenance costs. The agency should review its procedures for recording this data, since it is required for the annual reports that must be submitted to the DNR Energy Center.

- Achievements in fleet management or reductions in fuel consumption that have been accomplished, including adoption of technologies to promote energy conservation, achievements in efficient trip planning and scheduling, and reductions in job-related travel.

- Anticipated changes in level of agency services that are expected to affect fleet management or fuel reduction efforts in the future.

The agency should classify vehicles in the agency fleet using the vehicle classes and class codes provided in Table 2.

Three groups of vehicles are included in the required classes:

- Passenger vehicles including sedans, station wagons, except when exempted;

- Light duty trucks up to 8,500 Gross Vehicle Weight Rating (GVWR), including vans, sport utility vehicles, pickup trucks and other trucks, except where exempted; and

- Alternative Fuel Vehicles, less than, equal to, and greater than 8,500 GVWR. (Conventionally fueled vehicles over 8,500 GVWR are exempt from reporting.)

An agency may exempt a vehicle that would otherwise fall into one of these reporting classes if it is not licensed for on-road use or if its primary use is one of the following: (1) used primarily off-road; (2) used primarily to haul trailers or heavy equipment; (3) used primarily for construction or maintenance; (4) used primarily to transport construction or maintenance equipment or materials; and (5) used primarily for law enforcement.

Agencies should apply principles of efficient management to all vehicles in their fleets, whether or not they are to be included in reports to the DNR Energy Center.

Detailed instructions for completing the reports are provided in Chapter IV.

In addition to reporting data in the worksheet format, we encourage the agency to include a narrative describing past fleet management achievements, as well as

changes in agency program services that are expected to affect fleet management or fuel reduction during the coming year.

2. Formulating goals: The next planning step is to assess potential savings and establish goals and objectives for conservation of work-related transportation energy.

   The broad fuel-reduction goal mandated in section 414.400, RSMo 1999, is to reduce state fleet fuel consumption. Each agency should incorporate an overall fuel reduction goal into its plan and describe any special factors that affect its ability to achieve a reduction.

   Each agency should formulate goals related to use of state fleet vehicles.

   Examples of specific fleet-efficiency goals might include:

   - To purchase vehicles that meet or exceed the CAFE standard (currently 27.5 miles per gallon for passenger cars and 20.7 miles per gallon for light trucks).
   - To improve vehicle maintenance.
   - To increase the number of employees using alternative transportation modes.

3. Formulating strategies: This includes extensive review of strategies for reducing transportation energy use in state fleets. Strategies should be tailored specifically to the agency's fleet requirements and the goals it has identified, and should be sufficiently specific to permit development of action steps.

   Examples of strategies to meet the specific goals listed above might be as follows:

   - Develop a preventative maintenance schedule for all vehicles in the fleet; and
   - Develop an educational and awards program for employees who use alternative transportation modes.

4. Ranking strategies: Strategies should be assigned priority based on their potential for achieving plan objectives and whether they can actually be implemented in the agency. In addition, consideration should be given to the order in which they can be implemented.

5. Implementation: Implementing the plan requires translating strategies into measurable action steps and assigning responsibilities and creating a timetable for carrying them out.

6. Monitoring and evaluating results: Monitoring and evaluating progress should be based on measurable objectives developed during the planning process. Criteria

specified in the plan for monitoring and evaluating the plan should be scrutinized to assure that they provide a good measure of the goals envisioned in the plan.

Submission of plans and annual progress reports

By September 1 of each year, the following should be forwarded to the DNR Energy Center:

- Any updates to the agency's Fleet Efficiency Plan;
- Worksheet 1, Annual Acquisitions and Conversions - Eligible Vehicles for the prior fiscal year;
- Worksheet 2, Annual Operating Data and Exemptions. Annual data reports on mileage and fuel consumption for conventional and AFV vehicles during the preceding fiscal year. Note annual exemptions on this worksheet
- Worksheet 3, Annual Report Narrative. The Annual Report Narrative should describe proposed changes in the objectives, strategies or action steps of the plan or in the timetable for replacing less efficient vehicles. The narrative also may describe accomplishments and concerns.

Agencies' annual reports will be incorporated into an overall state fleet efficiency report prepared by the DNR Energy Center. Section 414.406, RSMo, 1999, requires this annual report to be submitted to the commissioner of administration, the secretary of the senate, the clerk of the house of representatives and the chairman of each committee of jurisdiction of the general assembly.

Goals, objectives and strategies

The following goals, objectives and strategies could be incorporated into the fleet efficiency plan formulated by an agency.

GOAL: Achieve a reduction of motor-fuel consumption.

Modifying the travel-related behavior of employees will generate significant energy savings. However, such efforts by themselves are likely to be insufficient. Fortunately, transportation energy can be conserved in three additional ways:

- The implementation of energy-conscious procurement policies, which can change the nature of state transportation fleets;
- The implementation of energy-conscious management practices, which can ensure that state employees are provided with fuel-efficient vehicles; and
- Enhanced maintenance practices, which can ensure that state vehicles are maintained in top fuel-efficient condition.

The objectives and strategies outlined below indicate some of the ways agencies can use these techniques to conserve energy.

Objective:
To implement procurement policies designed to increase the energy efficiency of the state fleet.

The greatest opportunity to improve overall fuel efficiency of agency fleets is at the procurement stage, when older and less fuel-efficient vehicles are replaced. Due in part to federal mandates, the fuel-efficiency ratings of automobiles and light trucks have increased in recent years.

Meaningful fuel savings can be gained by considering the fuel-efficiency ratings of motor vehicles during the procurement process. Additional savings can be obtained by making fundamental changes in the way vehicles are purchased. Consideration should be given to size, options and the type of fuel they consume. The strategies outlined below provide guidance on how such objectives can be achieved.

Effective implementation of the strategies under this objective can be evaluated as a group in terms of annual increases in the MPG rating of the fleet. Each of the strategies below will contribute towards meeting the objective.

Strategy: Only purchase vehicles that meet or exceed CAFE standards

Strategy: Increase the proportion of fuel-efficient vehicles.

Vehicle size has a tremendous influence on fuel efficiency. A recent DOE publication estimates that "for every 500 pounds of additional weight, fuel economy can be reduced by up to five MPG". The more an agency's needs can be met through the use of smaller vehicles, the greater the energy savings.

Implementation suggestions:

- Conduct a formal assessment to determine vehicle use. Determine:
  - The passenger-carrying capabilities of procured vehicles;
  - The number of vehicles needed with large cargo space;
  - The proportion of vehicles needed for local versus long-distance travel; and
  - The required vehicle options.
- Based upon the results of the needs assessment, purchase as high a proportion of smaller, fuel-efficient vehicles as possible.

Objective:

To increase and maintain efficient fuel usage within the fleet through enhanced fleet management and maintenance procedures.

Fleet managers can increase energy efficiency by implementing policies and procedures related to optional use of vehicles, and through maintenance procedures.

Strategy: Institute a formal program to assign vehicles based upon travel requirements. Smaller and more fuel-efficient vehicles should be assigned first.

If there is flexibility within the fleet, more fuel-efficient vehicles should be released before the release of other vehicles. This practice assumes that the travel needs can be met with a smaller vehicle.

Implementation suggestions:

- Develop a screening process at the time of vehicle requests to determine the appropriate type of vehicle to be assigned.
- Assign the smallest, most fuel-efficient vehicles first.

Strategy: Develop energy-efficient routes and schedules for routine trips.

Some agencies make routine trips on a regular basis. Energy can be saved if these trips can be consolidated, regularly scheduled and take the most efficient route selected.

Implementation suggestions:

- Develop trip schedules so vehicles can operate at full capacity.
- Select the shortest route and avoid hills, construction zones and bad roads.

- Include as many stops as possible in one trip and avoid backtracking and "dead time."
- Use the most efficient vehicle available.
- Carpool or mass transit employees to metropolitan areas and then use fleets for specific tasks.

Strategy: Institute a program to assess tire pressure and wear of all vehicles on a routine basis.

Studies suggest that for every two pounds that tires are below recommended pressure, one percent of fuel economy is lost. Gas mileage can increase by approximately two percent by keeping all tires inflated to recommended pressures. Similarly, tires that are out of balance or abnormally worn will decrease fuel efficiency.

Implementation suggestion: Agencies wishing to implement this strategy should institute a program whereby:

- Air pressure and wheel weights on tires are checked every two weeks.
- Tread wear is checked to ensure proper wheel alignment at regular oil/maintenance intervals.
- Tires are rotated as recommended by the manufacturer.

Strategy: Institute a formal maintenance program to maintain the maximum fuel-efficiency ratings of all fleet vehicles.

Well-tuned and maintained vehicles use less fuel. One recent study suggests the MPG ratings of an automobile may be increased by four percent to 12 percent by a simple tune-up.

Implementation suggestion: The following steps are suggested for maintaining fuel efficiency of state vehicles:

- Carefully adhere to the tire maintenance schedule.
- Check the oil level when fueling.
- Change the oil and oil filter every six months or 6,000 miles, unless using a synthetic lubricant or manufacturer recommendations suggest otherwise. With guidance from DNR, Hazardous Waste Program, establish a means for recycling used oil and oil filters.
- Check monthly under the car for oil leaks.
- Change the fuel filter according to the manufacturer's recommendation and look for fuel leaks.
- Check the air filter according to the manufacturer's recommendations.
- Check the brake, clutch, power steering and coolant fluid at every oil change interval.
- Check brake pads, shoes and brake adjustment on annual license inspection and at oil change intervals.
- Check wheel bearings according to manufacturer's suggested intervals.

- Check transmission and differential lubricant at oil change intervals.
- To ensure quicker starts, examine battery and starter motor cables for corrosion at oil change intervals.
- Inspect radiator, heater, and air conditioner hoses at oil change intervals.
- Check your engine with a diagnostic engine analyzer every 12 months.
- Check exhaust with an emissions analyzer to determine and adjust for air-fuel ratio and levels of unburned fuel in regions where emissions analyzers are available.
- When tires are worn, replace with tires of low rolling resistance.

Goal: Increase energy conservation through modifications in employee travel behavior.

Objective:
To reduce work related travel of state employees.

Strategy: Each agency can reduce the number of discretionary trips, carpool when possible, use public transportation, practice efficient driving techniques and choose meeting locations that ensure maximum fuel conservation.

Often the best energy conservation practices are just good common sense. Trips can be avoided by conducting business by telephone or other electronic means. When traveling, consolidate trips and plan a route with energy conservation in mind. Efficient driving techniques will help to conserve more fuel and time.

Whenever feasible, coordinate trips with coworkers. The use of public transportation is an even better alternative. Public transportation is vastly more fuel-efficient than a car in terms of passenger-miles-per-gallon of fuel consumed. Finally, when planning or conducting a meeting, consider the travel requirements of those attending. The amount of energy that can be saved is directly proportional to the convenience of the meeting site to the greatest number of individuals.

Implementation suggestions:

- Eliminate needless trips by conducting business by telephone, facsimile (FAX) machines, mail and interactive computer systems.
- Consolidate trips and plan routes.
- Pursue methods of improving overall driving techniques of employees.
- Coordinate travel with that of other employees and form a carpool.
- Purchase fare books and encourage employees to use public transportation.
- Consider the origins of attendees and their travel requirements when planning meetings, conferences and workshops. These events could be held at sites that eliminate or reduce the need for travel.
- Encourage hotel selection to include proximity to mass-transit.

Strategy: Expand the use of telecommunications systems to decentralize work and reduce the need for travel to meetings, conferences and other offices.

Thanks to recent advances in telecommunications equipment, the need for face-to-face meetings is rapidly diminishing. There are now teleconferencing options that allow interactive and effective meetings between individuals at separate sites to take place at a fairly reasonable cost, using local downlink facilities. This teleconferencing technique is only one of a number of helpful telecommunications devices, like facsimile machines, telewriting machines, slow-scan televisions and interactive computer terminals, which may be available to your agency. In many instances the need for travel can be significantly reduced, if not eliminated, through the use of this type of technology.

Implementation suggestions: Agencies should consider the following options as an alternative to single-site meetings, which require extensive travel of employees:

- *Audio-Only Teleconferencing* uses telephone lines and teleconferencing "bridges," participants at over one hundred sites can interact.
- *Audio-Plus Teleconferencing* uses the same technology described above, but supplements it with handout materials, overheads and videos.
- *Two-Way Video Teleconferencing* allows participants at remote sites to both see and hear each other.
- *One-Way Video/Two-Way Audio Teleconferencing* transmits a video image from a single site, while two-way audio interaction is possible from several distinct locations.

Objective:
To increase the driving efficiency of state employees.

According to a report issued by the U.S. Department of Energy, "The driving technique of the person behind the wheel is the most important element in determining the fuel economy of any car. A careful driver may get 20 percent more miles per gallon than the average driver and 50 percent more than a wasteful one". Thus, to the extent that the driving behavior of commuters and the users of the vehicles within agency fleets can be enhanced, fuel can be conserved.

Strategy: Enhance awareness of the need to drive efficiently through employee-awareness campaigns, newsletters and the circulation of materials related to this subject.

Before individuals are willing to modify their behavior, it is frequently necessary to provide them with information and educational materials. Articles within agency newsletters and fliers, and posted on bulletin boards are all effective ways of reaching workers.

Implementation suggestions:

- Place articles on efficient driving in agency newsletters.
- Distribute literature on energy-efficient driving.
- Show videos at appropriate times during the work day.
- Conduct informal discussion groups.

Strategy: Implement driver-efficiency training workshops for agency employees.

A number of model courses on efficient driving have been developed. In fact, during the 1980's, the U.S. Department of Energy offered courses around the country and trained instructors. The materials used for these courses are available and can be reproduced free of charge.

Implementation suggestions:

- Contact the DNR Energy Center to obtain information with which to educate employees on energy-efficient driving techniques.
- Conduct driver-efficiency workshops for agency employees.

Plan outline

The cover page of the plan should identify the agency as well as name, address and phone number of the preparer(s).

The plan should specify the number of vehicles in the fleet and the overall percentage goal for reducing consumption. The plan should also summarize how many and what kinds of vehicles in the agency fleet are not included in the plan and the reasons for their exclusion. An agency may exempt a vehicle from reporting if it is not licensed for on-road use or if its primary use is one of the following: (1) used primarily off-road; (2) used primarily to haul trailers or heavy equipment; (3) used primarily for construction or maintenance; (4) used primarily to transport construction or maintenance equipment or materials; and (5) used primarily for law enforcement. Worksheet 3, Exempt Vehicles, should accompany the plan and provide a detailed enumeration of excluded vehicles.

General requirements for the plan include:

- State the agency goals for fleet fuel-consumption reduction.
- List the strategies and incentives to be included in the program.
- Indicate how, when and by whom the strategies and incentives will be implemented.
- Define a method to monitor and evaluate the program.

The agency plan should address all areas where significant transportation-related energy savings are possible: fleet enhancement and employees' work-related travel behavior. Therefore, the plan should indicate that the following have been considered:

- Ways to reduce the volume of work-related travel such as carpools, use of mass transit, centralized meeting locations and lowering the number of discretionary trips.
- Ways that telecommunications equipment could be used to reduce the need for travel.
- The potential for conserving energy by efforts aimed at increasing employees' driving efficiency. Examples of these measures could include driving-efficiency training, awareness campaigns on the need for efficient driving, use of bulletin boards and newsletter articles. DNR Energy Center will assist with providing this information.
- Means for increasing the overall fuel efficiency of the agency's fleet. Examples of these efforts could include: mileage ratings at the time of vehicle procurement,

increasing the proportion of smaller vehicles within the fleet and considering the procurement of alternative fuel vehicles.

- Ways in which fuel efficiency could be increased by enhanced fleet-management and maintenance procedures may include: assigning vehicles based upon actual needs, instituting routing and scheduling procedures for routine trips, implementing tire-pressure assessment procedures and monitoring and maintaining acceptable fuel-efficiency ratings on all vehicles.

The plan should indicate that monitoring and evaluation were carefully considered during the preparation of the transportation-related portion. The plan should:

- Include quantitative objectives wherever possible, against which the agency's progress in energy conservation may be measured;

- Specify who will be responsible for implementation of various portions of the plan; and

- Be updated and adjusted on a routine basis.

CHAPTER III

ALTERNATIVE FUEL PLANS

ALTERNATIVE FUEL VEHICLES FOR THE STATE FLEET
A guide document for state agencies to develop Alternative Fuel Vehicle (AFV) plans

Benefits

The use of alternative fuels in state agency fleets results in many benefits:

- Gain experience in AFV technology and program implementation early on so sound decisions may be made for increased participation.

- Develop adequate refueling, equipment and maintenance infrastructures when the Energy Policy Act (EPACT), Clean Air Act Amendments (CAAA) or other legislation take effect.

- Can reduce fleet emissions, particularly in the non-attainment regions of the state, and meet AFV acquisition requirements as specified in the EPACT or CAAA.

- Can offer increased choices of fuel types, which would reduce vulnerability to fuel shortages, increase energy self-reliance and improve economics of AFVs.

- Set a public example of environmental concern and confidence in AFV technologies.

- Develop expertise with successful application of AFV technology and with implementing an AFV program.

- Can help to establish a network among private and public entities for efficient transmittal of information on purchase and operation of alternative fuels and vehicles.

- Promote fuel diversity and the use of domestic fuel.

Scope and applicability

Missouri state law requires state agencies that operate more than 15 motor vehicles to implement plans for acquiring AFVs. State agencies with more than 15 motor vehicles must acquire vehicles capable of using alternative fuels as follows:

- At least 50 percent of the agency's fleet vehicles acquired between July 1, 1998, and July 1, 2000, and each biennial period thereafter.

- It is required that at least 30 percent of all motor fuel purchased annually for use in alternative fuel vehicles, calculated in gasoline gallon equivalents, be alternative fuel.

- Agencies that operate 15 or fewer vehicles are encouraged to participate in acquisition of AFVs to the extent possible. An agency can include AFVs above 8,500 GVWR.

- For the purpose of this plan, state agencies can include both non-converted OEM (original equipment manufacturers) vehicles and conversions.

The implementation of this plan primarily targets light-duty sedans and trucks. This does not exclude participation by state agencies that desire to acquire alternative fuel heavy-duty, law enforcement and special purpose vehicles.

Plan components

The following components should be included in the AFV Plan:

- Vehicle acquisition goals

  Describe AFV acquisition goals.

  State agencies are encouraged to place priority on vehicle acquisitions in non-attainment areas when developing plans for AFV acquisitions.

- AFV education/training programs

  State agencies must also consider the need for AFV education and training workshops. There is a need to increase user awareness of alternative fuels, provide an informational and educational forum and address specific issues associated with introducing, converting and operating AFVs.

Plan development: Issues and information to consider

Acquisitions of AFVs will require agency planning and interagency coordination.

In developing a plan for acquiring AFVs, agency officials should consider factors such as current fleet characteristics, environmental characteristics/impacts, economic characteristics/impacts, infrastructure supply, regulatory and incentive considerations and related issues that may influence the plan development.

1. Current fleet characteristics

   Fleet information is necessary to determine the most effective AFV program in terms of vehicle compatibility. One AFV approach may be more practical than another depending on fleet size, the type of vehicles, replacement schedules, and usage. For example, if a majority of the fleet is used for one or two passengers and for short-range travel, an alternative fuel that best meets these needs should be considered.

2. Environmental characteristics/impacts

   Collecting and evaluating environmental information is critical, since different fuels, vehicles, usages and vehicle ages exhibit different levels and types of emissions. The

choice of fuel may be dependent upon the current or anticipated levels of a particular emission in the state or region.

In Missouri, it is important to recognize that the St. Louis region has been designated a moderate ozone non-attainment area by the EPA. This status may be moved to the more serious non-attainment category. This would mean provisions in the Clean Air Act would apply to the region and would include any state-owned fleets of 10 or more vehicles in the area. Kansas City has won redesignation from the EPA as achieving air quality standards and is considered to have air quality maintenance status. The fleets in the Kansas City region are not currently subject to Clean Air Act provisions; however, both metropolitan regions (areas with a 1980 population of 250,000 or more) are subject to the provisions of the Energy Policy Act. This applies to all fleets of 20 or more vehicles.

3. Economic characteristics/impacts

Funding mechanisms for the purchase and operation of AFVs will have to be determined in developing the plan. The typical AFV costs are divided into three categories: purchase price or retrofit costs; operating costs of fueling and maintenance and resale value, a "negative cost."

Because large-scale AFV markets and fuel supply infrastructures have not yet been fully established, these costs will in many cases be rough estimates. Different cost assumptions may be suitable for various regions, due to factors such as potential market size, fuel-distribution infrastructure and resale market.

An analysis of AFV costs should include:

- The incremental purchase cost of OEM vehicles. This is defined as the difference between the alternative fuel vehicle cost and a gasoline powered vehicle of the same make and model;

- The retrofit cost for after-market conversions;

- The estimated annual incremental-maintenance costs is defined as the difference between AFV maintenance costs and those for a gasoline-fueled vehicle of the same make and model;

- The fuel costs of the alternative fuel, converted to dollars per equivalent gallon of gasoline. The economics of the AFV industry are dynamic. Costs may change due to technological developments, as well as order quantities or special agreements. The AFV industry may be the best source for keeping abreast and refining this information; and

- The relative emissions of each fuel type.

- Fuel supply infrastructure issues and information.

Availability of both alternative-fuel vehicles and the infrastructure needed to serve them should be determined. Original Equipment Manufacturers (OEMs) may not have ample supplies of a given type of AFV. Similarly, in some areas of the state, fueling and/or service infrastructures may not be available for a particular AFV. The DNR Energy Center will provide assistance with information from OEMs and fuel/service providers. Further, arrangements can be considered by agencies and suppliers to form the most ideal infrastructure possible.

4. Infrastructure supply

   Infrastructure information to consider when comparing AFVs based on different fuels includes:

   - Existing fueling station locations;
   - Existing repair and maintenance facilities and locations; and
   - OEM vehicles or after market conversion kits available.

   The agency should not limit planning for AFVs to areas that have already developed infrastructures. One purpose of these plans is to encourage refueling suppliers to build the new infrastructure. Also, different types of vehicles should be considered, regardless of current fuel availability.

5. Current or proposed legislation issues

   The agency should evaluate pending legislation as well as current local, state or federal regulations to determine the impact on alternative fuel vehicle types.

The following table indicates legislative issues current during the assembly of this document:

TABLE 1 - LEGISLATION ASSESSMENT

COMPARISON OF KEY PROVISIONS OF FEDERAL AND MISSOURI ALTERNATIVE FUEL LAWS

CLEAN AIR ACT	ENERGY POLICY ACT	MISSOURI SECTION 414.400-414.417, RSMo, 1999
METROPOLITAN AREAS:		
22 metropolitan areas with populations of 250,000 or more (1980 census) with either serious, severe, or extreme ozone or carbon monoxide areas.	Metropolitan areas with a 1980 population of 250,000 or more.	All state-owned vehicles throughout the state.
COVERED FLEET:		
Fleets of ten or more vehicles which are centrally fueled or capable of being centrally fueled.	Fleets with at least 20 vehicles that are centrally fueled or capable of being centrally fueled in a metropolitan area; however, this requirement applies only if a fleet also has at least 50 vehicles within the United States.	State-owned fleets with more than 15 vehicles.
EXEMPTIONS:		
Vehicles that are garaged at a personal residence overnight are to be considered not capable of central fueling. Law enforcement vehicles. Emergency vehicles.	Private fleet vehicles that are garaged at home overnight are exempted. Law enforcement vehicles, however the Secretary of Energy may terminate the exemption. Emergency vehicles.	Off-road vehicles, maintenance and construction vehicles, and transport trailers. Law enforcement vehicles. Emergency vehicles.

CLEAN AIR ACT	ENERGY POLICY ACT	MISSOURI SECTION 414.400-414.417, RSMo, 1999
FUELS		
Any fuel that meets the emission standard may be used, including reformulated gasoline, clean diesel, methanol, propane, electricity, and natural gas.	Alternative fuels include methanol, ethanol, natural gas, biodiesel (B20), propane and electricity. Reformulated gasoline is not considered to be an alternative fuel.	Alternative fuels include 85% methanol, 85% ethanol, natural gas, propane, hydrogen, biodiesel (B20), and electricity. Reformulated gasoline is not considered to be an alternative fuel.
WEIGHT LIMITS:		
Includes automobiles and trucks up to 26,000 pounds gross vehicle weight.	Includes vehicles with a gross vehicle weight of less than or equal to 8,500 pounds.	Includes vehicles with a gross vehicle weight of less than or equal to 8,500 pounds.
PURCHASE DATES:		
Beginning with model year 1998.	Federal fleet – 1993. State fleets - model year 1996. Private and municipal fleets – model year 1999 or later (subject to ruling by the Secretary of Energy that a private/municipal fleet program is needed.) Fuel provider fleets – model year 1996.	Acquire vehicles capable of using alternative fuels: 10% by July 1, 1996 30% by July 1, 1998 50% by July 1, 2000 and thereafter 30% alternative fuel use in AFVs by July 1, 2001

CLEAN AIR ACT	ENERGY POLICY ACT	MISSOURI SECTION 414.400-414.417, RSMo, 1999
VEHICLE AND FUEL AVAILABILITY:		
There are no exemptions provided in the law in the event vehicles or fuel are not available.	The Secretary of Energy must exempt a fleet if vehicles or fuels are not available.	The Missouri DNR director may reduce any percentage specified or waive requirements upon receipt of certification supported by evidence to the director that: 1) Fuels are not available; 2) Fuels do not meet cost limitations; or 3) Fuels do not meet energy conservation or emissions criteria.

6. Other issues and information to consider

   The agency may wish to evaluate additional issues to determine the most appropriate AFV strategy. Strategy examples include promotion of local fuels, reduction of dependence on imported fuel sources, regional employment and economic impacts and the value of experience gained in developing an AFV program. For example, if the agency desires to gain experience in a variety of AFVs, they may choose a diverse range of AFVs. Similarly, the agency may desire to incorporate AFVs that use local fuels in order to stimulate economic growth.

   The agency also should attempt to identify potential partners, public and private, that may face the same constraints or opportunities regarding AFV choices.

Annual progress reports and plan updates

After the plan is developed, the DNR Energy Center will work with state agencies to develop an annual report. In addition to the number and type of AFVs purchased during a specific year, progress reports should cover any changes in vehicle emissions or fleet size which would affect AFV purchases. A brief narrative of the steps taken to achieve the goals of the plan should be included in the annual report.

CHAPTER IV

ANNUAL REPORTS

Annual reporting on Missouri state fleet operations

All Missouri state fleet operations are reported annually in the Missouri State Fleet Efficiency and Alternative Fuel Program Annual Report. State fleet operations, gasoline vehicle operations and alternative fuel vehicle operations are the three reporting categories covered in the annual report. Sections 414.400 - 414.417 RSMo entrusts the Missouri Department of Natural Resources' Energy Center with the task of collecting and analyzing the state fleet operations data for the annual report. The Energy Center is also assigned the responsibility of writing and distributing the annual report to the designated state personnel. The reporting parameters required for the annual report are annual fuel consumption, number of vehicles, vehicle miles traveled, average fuel economy, estimated cost savings and alternative fuel use.

Annually, all Missouri state agencies report their agencies' fleet operations data to the Energy Center on or before September 1st. The agency fleet operations data includes an entire fiscal year of agency fleet operations. The fiscal year runs from July 1st through June 30th.

Fleet managers use the data collection forms provided by the Energy Center to report their agency's fleet operations data to the Energy Center. The three data collection forms labeled Worksheets 1, 2 and 3 can be found in Appendix C. Using the first two worksheets, the fleet managers are able to report vehicle-operating data on both eligible vehicles and exempt vehicles. The terms eligible vehicles and exempt vehicles are explained in more depth in the following sections.

For reporting vehicle classifications on the worksheets, please use the following vehicle classifications:

TABLE 2 - VEHICLE CLASSIFICATIONS

Autos	includes sedans and station wagons
Light Duty Trucks (LDT) < or = 8,500 GVWR	includes vans, sport utility vehicles, pickups
Alternative Fuel Vehicles (AFVS)	includes autos, buses, light duty trucks (LDT), medium duty trucks (MDT – 8,501-26,000 lbs.), heavy duty trucks (HDT – > 26,000 lbs.)

Instructions for completing annual report worksheets

Please use the following reporting standards to submit fleet operations data to the Energy Center. No other method of data submission can be accepted or processed by the Energy Center.

1. To submit fleet operations data to the Energy Center, use only the worksheets and/or copies of the worksheets found in Appendix C. The reporting of fleet operations data in the worksheets must also be consistent with the method described on the worksheets and in this model plan.

2. For the purpose of reporting fleet operations data to the Energy Center, each state agency must assign one person as the agency's fleet manager. Agency fleet operations data will only be accepted, at the Energy Center, from the fleet managers.

3. Fleet operations data submitted by each state agency must be complete; each agency's fleet manager will submit fleet operations data for the whole agency at the same time. If an agency is divided into smaller units such as divisions, the fleet manager will collect the fleet operations data from all agency units before submitting the agency's fleet operations data to the Energy Center.

Worksheet 1 - Annual Acquisitions and Conversions - Eligible Vehicles

Section 414.410 RSMo requires that state agencies comply with AFV acquisition requirements in accordance with the timetables and other criterion given in the statutes. To show compliance with the statutes, state agencies report to the Energy Center all eligible vehicle acquisitions and conversions in the annual reporting Worksheet 1. Vehicle acquisitions include all new or used eligible vehicles acquired during the fiscal year. Vehicle conversions are agency vehicles converted from burning only gasoline to vehicles that burn an alternative fuel, such as liquid petroleum gas or compressed natural gas. If an otherwise exempt vehicle that uses an alternative fuel is acquired or an otherwise exempt vehicle is converted to use an alternative fuel, then the vehicle is no longer considered exempt and the data for this vehicle should be reported in Worksheet 1 and the top half of worksheet 2.

Fleet locations specified on Worksheet 1 are important reporting regions for Missouri state agencies. The fleet locations include: Jefferson City, Kansas City, St. Louis, and other (for all other locations). Kansas City and St. Louis are important reporting regions because they are defined as Standard Metropolitan Statistical Areas (SMSA) by the federal government. State vehicles located in and around the Kansas City and St. Louis areas are also tracked as applicable under the Clean Air Act Amendments of 1990 and the Energy Policy Act of 1992. The Jefferson City area is also important for annual fleet reporting because most state fleet vehicles are located in the Jefferson City area.

To promote consistent reporting, please use the following **guidelines** when completing Worksheet 1:

1. If agency fleet vehicles are located in more than one of the cities listed on Worksheet 1, fill out separate worksheets for each of the **fleet locations** where the agency fleet vehicles are located. The fleet location of **Kansas City** includes all vehicles located in Cass, Clay, Clinton, Jackson, Lafayette, Platte and Ray Counties. The fleet location of **St. Louis** includes all vehicles located in Lincoln, Warren, St. Charles, Jefferson, Franklin, St. Louis County and St. Louis City.

2. If the same type of conventional fuel vehicles are acquired during the same period, combine the vehicle data into the same row by entering the number of vehicles into the first column labeled number of vehicles on Worksheet 1.

Worksheet 2 - Annual Operating Data - Eligible and Exempt Vehicles

Annual operating data are collected on all **eligible** vehicles in Worksheet 2. Eligible vehicles are vehicles subject to fuel efficiency requirements or alternative fuel requirements. The motor fuels used to fuel the eligible vehicles are gasoline (gas), diesel (Dsl), ethanol-85 (E-85), liquid petroleum gas (LPG or propane), compressed natural gas (CNG) and biodiesel. Eligible vehicles can also be defined as all vehicles that are not exempted. Alternative fuel vehicles should be reported as eligible vehicles on worksheets 1 and 2, even if the vehicle could otherwise be defined as an exempted vehicle.

Some annual operating data for exempt vehicles are reported on Worksheet 2. Vehicles can be exempted on Worksheet 2 if the vehicle fits into at least one of the following categories:

1. Vehicle(s) **over 8,500 GVWR**

2. Vehicle(s) used primarily in **off-road** applications

3. Vehicle(s) used primarily in **construction** applications

4. Vehicle(s) used primarily in **road maintenance** applications

5. Vehicle(s) used regularly in the movement of **maintenance** equipment

6. Vehicle(s) used regularly in the movement of **construction** equipment

7. Truck(s) or utility vehicle(s) used regularly to **transport trailers**

8. Vehicle(s) with manufacturer-stated capacity exceeding that for **six persons**

9. **Used class III vehicle(s)** purchased from the highway patrol

10. Vehicle(s) used primarily for **criminal law enforcement**

11. **Motorcycle(s)** and/or **all-terrain vehicle(s)**

12. **Ambulance(s)** and/or vehicle(s) used primarily for **fire emergencies**

13. Vehicle(s) for which the EPA has not published fuel economy comparisons

To promote consistent reporting, please use the following **guidelines** when completing Worksheet 2:

1. For **fleet locations**, follow the same guidelines as on Worksheet 1.

2. The **number of vehicles operated** and other operating data should be reported on all vehicles operated throughout the fiscal year, regardless of the ownership status of the vehicles at the end of the fiscal year.

3. Enter fuel consumption only using the following **units of consumption**: gallons of gasoline, gallons of propane, gallons of diesel, gallons of 85 percent ethanol (E-85) and cubic feet for natural gas. Biodiesel usage should be converted to gallons of B100. For example, 250 gallons of B20 is equivalent to 50 gallons of B100.

If the fuel consumption data is reported in different units of consumption than specified in number 3, please write the units of consumption by the fuel consumption data

As stated in RSMo 414.400 and 414.417, some special purpose vehicles can be exempted from some reporting requirements. All data on exempted vehicles are reported in Worksheet 2. Summary data on exempt vehicles are also collected at the bottom of Worksheet 2 in the section labeled *Exempt Vehicles*. The summary data collected on all of the agency's exempt vehicles includes number of exemptions < = 8500 lbs., number of exempt vehicles > 8500 lbs., total gasoline cost, total gasoline consumption (gallons), total diesel fuel cost, total diesel fuel consumption (gallons), total biodiesel consumption, total biodiesel cost, and total maintenance cost.

APPENDICES

APPENDIX A

GLOSSARY

Glossary

Alternative fuel: Includes methanol and ethanol mixtures containing 85 percent or more by volume of methanol or ethanol mixed with gasoline or other fuels, compressed/liquid natural gas, liquified petroleum gas, biodiesel and electricity. Reformulated gasoline is not considered an alternative fuel under the National Energy Strategy legislation; however, it may qualify as an alternative fuel under the Clean Air Act Amendments of 1990 (pending EPA regulation).

Alternative fuel vehicle (AFV): A vehicle either designed and manufactured by an OEM or a converted vehicle designed to operate using either a dual fuel, flexible fuel or dedicated fuel.

Barrel: A liquid measure equivalent to 42 gallons, often used to refer to quantities of crude oil.

BTU: British Thermal Units, a universal measure which may be used to compare energy consumption of different fuels.

Carbon dioxide (CO_2): A compound of carbon and oxygen formed when carbon is burned.

CCF: Hundreds of cubic feet; standard unit for measuring compressed natural gas consumption.

Class 1, 2 and 3 Sedans: A classification of sedans established each year by the Missouri Office of Administration, Division of Purchasing, after reviewing model vehicles available for purchase. These definitions are forwarded each year to state agencies. In general, Class 1 sedans are the smallest and Class 3 are the largest.

Converted vehicle: A new or used vehicle that is reconfigured to operate using an alternative fuel.

Dedicated: A vehicle that is designed to operate on only one fuel.

DNR or MDNR: Missouri Department of Natural Resources.

Dual-fuel: A vehicle that has the ability to operate using either alternative fuels or conventional fuels, but only one at a time.

Energy conservation measure (ECM): A technology or practice that reduces energy consumption.

Engine size: The number of cylinders of a particular vehicle type; includes 4, 6 and 8 cylinder engines, or larger for buses and heavy-duty vehicles.

Fleet: All vehicles owned by an agency or other governmental unit.

Flexible-fuel vehicle: A vehicle that has the ability to operate on alternative fuels, conventional fuels or a mixture of both.

Fuel configuration (of an alternative fuel vehicle)**:** Includes flexible fuel, dual fuel or dedicated fuel.

Fueling arrangements: Includes central, multiple or public fueling facilities.

Gallon: A unit of liquid measure equivalent to 4 quarts, or 1/42 of a barrel.

GGE: Gallons of gasoline equivalent, a measure which may be used to compare energy consumption of different fuels.

Gross Vehicle Weight Rating (GVWR): The maximum allowable weight for equipment, payload, fuel and occupants, as established by the manufacturer of the vehicle. Typically used for passenger vans and non-passenger vehicles, but not for sedans.

Life-cycle costing (or vehicle life-cycle costing): A method of economic evaluation that accounts for all costs over the lifetime of a vehicle. Life-cycle cost calculations for a vehicle should include the following: purchase price; expected lifetime of the vehicle; the projected number of miles it will be driven each year; projected operating costs, particularly fuel costs; projected annual maintenance costs, including oil, tires, scheduled maintenance and unscheduled maintenance and its expected salvage value when it is retired. Because costs will be incurred over several years, a standard discount rate should be applied to determine the net present value of costs incurred by purchasing the vehicle.

Light-duty vehicles: Includes sedans and light-duty trucks of 8,500 lbs. gross weight or less.

Motor gasoline: A petroleum product generally produced through the refinement of crude oil with a heat value of 1.32 million BTU per barrel.

MPG: Miles per gallon.

Original equipment manufacturers (OEMs): Vehicle manufacturers that provide the original design and materials for assembly of their product. The OEM is directly responsible for manufacture and modification of vehicles, makes the vehicles commercially available, and provides a warranty for the entire finished product.

Primary use: A vehicle's usage; may include short or long-range travel, passenger or material loads.

State agency: Each board, commission, department, officer, other administrative office or unit of the state other than the general assembly, the courts, the governor or a political subdivision of the state, existing under the constitution or statute and authorized by the constitution or statute to make rules or to adjudicate contested cases (Section 536.010.5, RSMo, 1994).

U.S. DOE: United States Department of Energy.

Teleconference: Communication among three or more individuals by means of telecommunications.

Vehicle class: Refers to class of motor vehicle based on gross vehicle weight rating (GVWR), number of passengers, or other characteristics.

APPENDIX B

RSMo 414.400-414.417

Missouri Revised Statutes
Chapter 414
Fuel Regulation and Conservation
Section *414.400*

Definitions--program for state fuel consumption reduction, fleet management and promotion of alternative fuels, University of Missouri, included duties--exceptions for certain vehicles.

414.400. 1. As used in sections 414.400 to 414.417, the following terms mean:

(1) "Alternative fuel", any fuel, including any alcohol fuel containing eighty-five percent or more by volume of such alcohol or other such percentage not less than seventy percent if determined by the United States Department of Energy by rule to be necessary to provide for the requirements of cold start, safety, or vehicle functions, natural gas, liquefied petroleum gas, any fuel other than alcohol derived from biological materials when designated by the United States Department of Energy as an alternative fuel, and hydrogen, or any power source, including electricity, and any other fuel that the United States Department of Energy determines by final rule is substantially not petroleum and would yield substantial energy security and environmental benefits, used in a vehicle that complies with the standards and requirements applicable to such vehicle pursuant to sections 414.400 to 414.417 when using such fuel or power source;

(2) "CAFE standard", the federal Corporate Average Fuel Economy standard, 15 U.S.C. 2002 or 40 CFR Parts 86 and 600 or 49 CFR Part 538 or proposed rule 49 CFR Part 538 until such rule is finalized;

(3) "Department", the department of natural resources;

(4) "Director", the director of the department of natural resources;

(5) "State agency", the same meaning as such term is defined in section 536.010, RSMo;

(6) "Vehicle fleet", any fleet comprised of vehicles with a manufacturer's gross vehicle weight rating of not more than eight thousand five hundred pounds registered for operation on the highways of this state pursuant to chapter 301, RSMo.

2. The department in consultation with the commissioner of administration shall develop and implement a program to manage and progressively reduce state agency vehicle fleet fuel consumption and promote the use of alternative fuels. The program shall require state agencies to meet minimum guidelines for efficient fleet management. Such guidelines shall be updated and revised every two years and shall require the overall vehicle fleet fuel efficiency for each agency to meet or exceed the fuel efficiency that would be achieved if each vehicle in the agency's fleet met the CAFE standard. The department may promulgate rules necessary to implement such guidelines. Further, provided that suppliers or state agencies have or can reasonably be expected to have established alternative fuel refueling stations as needed, the program shall require that at least thirty percent of all motor fuel purchased annually for use in alternative fuel vehicles, calculated in gasoline gallon equivalents, to be alternative fuel by July 1, 2001. Any alternative fuel purchased by a state agency for use in vehicles not included in their vehicle fleet as defined in subsection 1 of this section, calculated in gasoline gallon equivalents, may be credited toward the annual alternative fuel purchase goal. The program shall systematically replace existing state-owned vehicles and vehicles paid for with any state money, including vehicles purchased by the university system, with vehicles manufactured, assembled or produced in the United States, as required by sections 34.350 to 34.359, RSMo.

3. The commissioner of administration shall identify specific vehicle models within each vehicle procurement class that meet or exceed the CAFE standard. State agencies shall identify specific vehicle models within each vehicle procurement class that have a life cycle cost which is less than or equal to the average life cycle cost of those vehicles in the class which are manufactured, assembled or produced in the United States. Life cycle costs shall include but are not limited to the original cost of the vehicle, conversion cost if applicable, costs associated with vehicle emissions to the extent that such statistics are available, and projected cost of operation, including fuel cost and maintenance and salvage value to the extent that reliable maintenance and salvage value statistics are available. Unless a state agency submits to the department a fleet efficiency plan that complies with the minimum guidelines for energy efficiency established pursuant to subsection 2 of this section, or unless otherwise approved by the office of administration pursuant to subsection 4 of this section, all purchases of vehicles for state agency vehicle fleets shall meet the above standards.
4. The commissioner of administration may waive the CAFE standard requirements of subsection 3 of this section, for only those vehicles which satisfy one or more of the following conditions, for any state agency upon receipt of documentation that has been certified by the director of the state agency as satisfying one or more of the following conditions:
(1) Such vehicles are used primarily in off-road, construction, or road maintenance applications;
(2) Such vehicles are regularly used in the movement of maintenance or construction equipment;
(3) Such vehicles are trucks or utility vehicles as defined by the office of administration that are regularly used to transport trailers for the purpose of moving state equipment; or
(4) Such vehicles are vehicles with manufacturer-stated seating capacity exceeding that for six persons and the director of the agency has certified that the vehicle will be used to transport its rated capacity in persons and/or cargo. Agencies which are granted such waivers shall comply with the planning requirements of section 414.403.
5. The purchase of all class III vehicles, as defined by the office of administration, shall be approved through the appropriations process for all departments except the highway patrol. The provisions of this subsection shall not apply to the purchase of used vehicles from the highway patrol.

(L. 1991 H.B. 45 § 1, A.L. 1998 S.B. 619)

Effective 1-1-99

Chapter 414
Fuel Regulation and Conservation
Section *414.403*

Vehicle fleet energy conservation plan to be developed by each state agency, purpose of plan, content--plan to be submitted to department of natural resources, when.
414.403. 1. Each state agency, with assistance from the department of natural resources, shall develop and implement a vehicle fleet energy conservation plan for the purposes of reducing vehicle fuel consumption. Plans shall be submitted to the director of the department of natural resources by January 1, 1993. Such plans shall include:
(1) A timetable by which fleet vehicles shall be replaced with vehicles which exceed the average fuel economy for their vehicle class as outlined in section 414.400;

(2) Options for the use of demonstrated innovative technologies that promote energy conservation and reduced fuel consumption;
(3) Methods that promote efficient trip planning and state vehicle use; and
(4) Car-pooling and van pooling for agency employees for commuting and job-related travel.
2. The department of conservation and the department of highways and transportation may develop their own vehicle fleet energy conservation plan. Such plans shall meet the objectives of sections 414.400 to 414.417 and shall comply with the reporting requirements of sections 414.400 to 414.417.

(L. 1991 H.B. 45 § 2)

Chapter 414
Fuel Regulation and Conservation
Section *414.406*

Vehicle fleet plan reviewed--office of administration to purchase only vehicles conforming to plan--annual report, content.
414.406. 1. The director of the department of natural resources shall review each agency's vehicle fleet plan and the vehicular demands of the agency by vehicle class. The office of administration shall only purchase for an agency those vehicles which conform to the agency's plan as outlined in sections 414.400 and 414.403.
2. Each state agency shall annually file a report with the director of the department of natural resources on forms provided by the department showing its progress in achieving the requirements and goals of sections 414.400 to 414.417. The director of the department of natural resources shall compile such information into an annual report and submit such report to the commissioner of administration, the secretary of the senate, the clerk of the house of representatives and the chairman of each committee of jurisdiction of the general assembly.
3. The director's report shall document progress in achieving the requirements and goals of sections 414.400 to 414.417 and shall include, but not be limited to, annual fuel consumption, number of vehicles, vehicle miles traveled, average fleet fuel economy, estimated cost savings and state use of alternative fuels.

(L. 1991 H.B. 45 § 3)

Chapter 414
Fuel Regulation and Conservation
Section *414.410*

Motor vehicle alternative fuel use plan to be developed by department of natural resources--powers and duties--state agency fleets of fifteen or more vehicles, time table for using alternative fuels.
414.410. 1. The director shall develop a motor vehicle alternative fuel use plan. The director shall cooperate with state agency fleet operators, vehicle manufacturers and converters, fuel distributors and others to identify the types of vehicles which could be converted to alternative

fuels. The director shall consider range, specialty uses, fuel availability, vehicle cost, vehicle manufacturing and conversion capability, safety, resale values, and other relevant factors.
2. The department shall recommend alternative fuels which state agencies and state universities may consider when purchasing vehicles. The department shall consider the content of vehicle exhaust emissions, the relative efficiency of the fuel, the relative efficiency of the processes required to produce the fuel and the characteristics of air emissions associated with the production of that fuel. It shall recommend for state use those alternative fuels which best satisfy the goals of energy conservation and emissions reduction.
3. Any state agency which operates a fleet of more than fifteen motor vehicles shall acquire vehicles capable of using alternative fuels as follows:
(1) At least ten percent of the agency's fleet vehicles acquired between July 1, 1994, and July 1, 1996;
(2) At least thirty percent of the agency's fleet vehicles acquired between July 1, 1996, and July 1, 1998; and
(3) At least fifty percent of the agency's fleet vehicles acquired between July 1, 1998, and July 1, 2000, and each biennial period thereafter.
If a state agency exceeds any such biennial acquisition goal, or has purchased vehicles capable of using alternative fuels before July l, 1994, such purchases may be credited to any future biennial acquisition goal. If a state agency has purchased vehicles capable of using alternative fuels but not included in their vehicle fleet as defined in subsection 1 of section 414.400, such purchases may be credited toward any biennial acquisition goal. If a state agency fails to meet a biennial acquisition goal, the commissioner of administration shall not authorize for such agency the purchase of any vehicle not capable of using alternative fuels until such acquisition goal is met, unless the director has reduced or waived the acquisition goal pursuant to subsection 1 of section 414.412.

(L. 1991 H.B. 45 § 4 subsecs. 1, 2, 3, A.L. 1998 S.B. 619)

Effective 1-1-99

Chapter 414
Fuel Regulation and Conservation
Section *414.412*

Alternative use of fuel, waived or percentage reduced by director of natural resources, certified evidence required--other vehicles, ethanol use required, exceptions.
414.412. 1. The director may reduce any percentage specified or waive the requirement of subsection 3 of section 414.410 for any state agency upon receipt of certification supported by evidence acceptable to the director that:
(1) The agency's vehicles will be operating primarily in an area in which neither the agency nor a supplier has or can reasonably be expected to have a central refueling station for alternative fuels; or
(2) The agency is unable to acquire or operate vehicles within the cost limitations of section 414.400 or section 414.415; or
(3) The use of alternative fuels would not meet the energy conservation and exhaust emissions reduction criteria of subsection 2 of section 414.410.

2. State agencies shall submit information describing the acquisition and use of vehicles capable of using alternative fuels to the department in a format prescribed by the department. The report shall include for each vehicle model capable of using alternative fuel:
(1) The types of alternative fuels used;
(2) The number of miles traveled using alternative fuels and the ratios to the total numbers of miles traveled;
(3) The number of vehicles owned which are capable of using alternative fuels;
(4) Maintenance costs.
3. Each state-owned vehicle equipped to operate on gasoline, other than vehicles using alternative fuel, shall use a fuel ethanol blend as defined in section 142.027, RSMo, when available at a competitive price, as its motor fuel, unless the United States Environmental Protection Agency, or the governor by executive order, promulgates rules which prohibit, limit or otherwise regulate the use of ethanol-blended fuels in ozone nonattainment areas, as defined by Section 107 of the federal Clean Air Act, as amended, or in an* area designated as a maintenance area for ozone under Section 175A of the federal Clean Air Act, as amended, state-owned vehicles shall not be required to use a fuel ethanol blend.

(L. 1991 H.B. 45 § 4 subsecs. 4, 5, 6, A.L. 1993 H.B. 611, A.L. 1998 S.B. 619)

Effective 1-1-99

Chapter 414
Fuel Regulation and Conservation
Section *414.415*

Percentage requirements, how state agencies to comply.
414.415. State agencies may meet the percentage requirements of sections 414.410 to 414.415 through purchase of original equipment manufactured alternative fuel vehicles or the conversion of vehicles, in accordance with federal and state requirements and applicable safety laws. Vehicles purchased pursuant to sections 414.410 to 414.415 shall not exceed the cost of conventional fuel vehicles of the same make and model by more than ten percent, using life cycle costing methods calculated pursuant to criteria in subsection 3 of section 414.400, except that vehicles purchased pursuant to sections 414.410 to 414.415 that are based for the life of the vehicle and used primarily in maintenance and nonattainment areas defined with regard to the National Ambient Air Quality Standards of the federal Clean Air Act, as amended, 42 U.S.C. 7401 et seq., shall not exceed such cost of conventional fuel vehicles of the same make and model by more than seventeen percent. The commissioner of administration in purchasing, leasing, maintaining or converting vehicles for alternative fuels use shall comply with all applicable safety standards promulgated by the United States Department of Transportation.

(L. 1991 H.B. 45 § 4 subsec. 7, A.L. 1998 S.B. 619)

Effective 1-1-99

Chapter 414
Fuel Regulation and Conservation
Section *414.417*

Criminal law enforcement vehicles and certain other vehicles, law not applicable--demonstration vehicles for alternative fuels authorized.

414.417. 1. Sections 414.400 to 414.417 shall not apply to the purchase or lease of a vehicle to be used primarily for criminal law enforcement or to the purchase or lease of a motorcycle, all-terrain vehicle, ambulance, or any type of vehicle for which the Environmental Protection Agency has not published fuel economy comparisons.

2. Notwithstanding the provisions of sections 414.400 to 414.417, the department of natural resources may acquire vehicles which use alternative fuels for the purposes of assessing and demonstrating either or both alternative vehicles and alternative fuels.

(L. 1991 H.B. 45 § 5)

Appendix C

Worksheets

MISSOURI DEPARTMENT OF NATURAL RESOURCES

ENERGY CENTER

REPORTING AGENCY		PAGE NUMBER
REPORTING PERIOD **2002 Fiscal Year**	PREPARED BY	
LOCATION/PHONE		DATE PREPARED

WORKSHEET 1 - MISSOURI STATE FLEET - ACQUISITIONS AND CONVERSIONS

FLEET LOCATION: ☐ **JEFFERSON CITY** ☐ **KANSAS CITY** ☐ **ST. LOUIS** ☐ **OTHER**

Only select one of the options provided. If agency vehicles are located at more than one of the options shown, fill out a separate Worksheet 1 for each option where agency vehicles are located. For a complete list of counties included in Kansas City and St. Louis, see the reference table shown on the back of this form.

ALTERNATIVE FUEL VEHICLES

For this section of Worksheet 1, enter acquisition data on one vehicle per row. Report all AFV acquisitions. Do not exempt any AFV acquisitions.

MAKE	MODEL	MODEL YEAR	VEHICLE CLASS	VIN	DATE ACQUIRED	OEM OR CONVERSION	DATE CONVERTED	ALT. FUEL TYPE	FLEX, DUAL OR DEDICATED	CAFE

CONVENTIONAL FUEL VEHICLES

For this section of Worksheet 1, group together the same type of vehicles in the same row. Do not enter acquisition data for exempt vehicles.

NUMBER OF VEHICLE(S)	MAKE	MODEL	MODEL YEAR	AUTO(S) OR LDT(S)	GAS OR DIESEL	CAFE

Instructions, definitions and reference tables are shown on the back.

INSTRUCTIONS AND DEFINITIONS FOR WORKSHEET 1

1. **Contact information** - enter all requested contact information into the space provided. On following worksheets, only the name of the agency and page number need be entered.
2. **Reporting period** - only submit information from the fiscal year that just ended. The fiscal year runs from July 1 through June 30.
3. **Alternative fuel vehicles** (AFV) are equipped to be refueled with an alternative fuel such as ethanol 85, CNG, propane or electricity. Please note that hybrid gasoline vehicles are not classified as AFVs.
4. **Model year** is the period from September 1 of the previous calendar year through August 31.
5. **Vehicle classification** - from the reference table, select the appropriate abbreviation and enter it into the space provided.
6. **VIN** - Enter the 17-character alpha-numeric vehicle identification number (VIN) that is assigned by the vehicle manufacturer. Include the VIN from only the acquisition of AFVs or vehicles converted to AFVs. Diesel vehicles refueled with biodiesel are not considered AFVs.
7. **OEM or conversion** - either the AFV was designed by the original equipment manufacturer (OEM) to run on alternative fuel, or the vehicle was converted to to run on alternative fuel after leaving the factory.
8. **Conversion** - an original equipment manufacturer's vehicle that is reconfigured by a conversion company. Conversion kit components are under warranty of the conversion company.
9. **Date converted** - if conversion, provide date when the conversion kit was installed.
10. **Flex fuel vehicles** run on a mix of fuels stored in the same on-board tank such as gasoline and ethanol 85.
11. **Dual fuel vehicles** can run on either an alternative fuel or gasoline. The fuels are stored on-board in separate fuel tanks. Each tank is specifically designated to hold one type of fuel.
12. **Dedicated AFVs** are vehicles equipped to be refueled with one type of fuel, the designated alternative fuel.
13. **CAFE** - for vehicles on contract with the State of Missouri, refer to the CAFE ratings tables prepared by the DNR Energy Center. For vehicles not on contract with the state, a complete list of vehicles can be found at www.fueleconomy.gov.
14. **Conventional fuel vehicles** (CFV) are vehicles designed to be refueled with one type of conventional fuel, either gasoline or diesel. However, since no equipment upgrades are necessary to use biodiesel, CFVs refueled with diesel can also be refueled with the alternative fuel, biodiesel.

COUNTIES INCLUDED IN THE METROPOLITAN STATISTICAL AREAS

Kansas City

1. Cass County
2. Clay County
3. Clinton County
4. Jackson County
5. Lafayette County
6. Platte County
7. Ray County

St. Louis

1. Franklin County
2. Jefferson County
3. Lincoln County
4. St. Charles County
5. St. Louis County
6. St. Louis City
7. Warren County

VEHICLE CLASSIFICATIONS (and Abbreviation)

1. Automobile and Station Wagon (**Auto**)
2. Light-Duty Truck, Vans and SUVs (**LDT**), (< = 8,500 lbs. GVWR)
3. Bus (**Bus**)
4. Medium-Duty Truck (**MDT**), (8,501 to 26,000 lbs.)
5. Heavy-Duty Truck (**HDT**), (> 26,000 lbs.)

MOTOR FUELS (and Abbreviation)

1. Gasoline (**Gas**)
2. Diesel (**DSL**)
3. Ethanol 85 (**E85**)
4. Compressed Natural Gas (**CNG**)
5. Propane (**LPG**)
6. Electric (**Elec**)

MISSOURI DEPARTMENT OF NATURAL RESOURCES

ENERGY CENTER

REPORTING AGENCY		PAGE NUMBER
REPORTING PERIOD **2002 Fiscal Year**	PREPARED BY	
LOCATION/PHONE		DATE PREPARED

WORKSHEET 2 - MISSOURI STATE FLEET - OPERATIONS

FLEET LOCATION: ☐ **JEFFERSON CITY** ☐ **KANSAS CITY** ☐ **ST. LOUIS** ☐ **OTHER**

Only select one of the options provided. If agency vehicles are located at more than one of the options shown, fill out a separate Worksheet 2 for each option where agency vehicles are located. For a complete list of counties included in Kansas City and St. Louis, see the reference table shown on the back of this form.

ELIGIBLE VEHICLES

VEHICLE TYPE	DESCRIPTION	NUMBER OF VEHICLES	MILES TRAVELED	FUEL COMSUMPTION		COST		
				GAS OR DIESEL	ALTERNATIVE FUEL	GAS OR DIESEL	ALTERNATIVE FUEL	MAIN-TENANCE
Gasoline	Cars and Station Wagons							
Gasoline	Light Duty Trucks, Vans and SUVs							
Diesel	Light Duty Vehicles, Not Otherwise Exempted							
E85	E85 Flex Fuel Vehicles							
CNG	Dual Fuel and Dedicated CNG Vehicles							
Propane	Dual Fuel and Dedicated Propane Vehicles							
Electric	Dedicated Electric Vehicles							

EXEMPT VEHICLES

MOTOR FUEL	NUMBER OF VEHICLES		FUEL COMSUMPTION (GALLONS)	COST	
	<= 8500 LBS	> 8500 LBS		MOTOR FUEL	MAINTENANCE
Gasoline					
Diesel					
Biodiesel (B100)					

Instructions, definitions and reference tables are shown on the back.

INSTRUCTIONS AND DEFINITIONS FOR WORKSHEET 2

1. **Contact information** - on the first worksheet, enter all requested contact information into the space provided. On following worksheets, only the name of the agency and page number need be entered.
2. **Reporting period** - only submit information from the fiscal year that just ended. The fiscal year runs from July 1 through June 30.
3. **Eligible vehicles** - this section of the worksheet is used for entering data on vehicles that are subject to vehicle efficiency and alternative fuel requirements as specified in Missouri State Statutes, RSMo 414.400 to 414.417.
4. **Fuel consumption** - enter fuel consumption using gallons for gasoline, ethanol 85, diesel, and propane. Use cubic feet for natural gas and kWh for electric. Report the usage of biodiesel in the exempt vehicle section of this worksheet.
5. **Exempt vehicles** - this section of the worksheet is used for entering data on vehicles that are not subject to vehicle efficiency or alternative fuel requirements as specified in Missouri State Statutes, RSMo 414.400 to 414.417.
6. **Number of vehicles** - for the exempt vehicles, enter into the first column the number of exempt vehicles that are less than or equal to 8,500 pounds GVWR. Into the second column, enter the number of exempt vehicles that are greater than 8,500 pounds GVWR.
7. **Biodiesel (B100)** - to report biodiesel consumption convert all biodiesel usage to B100. For example, 250 gallons of B20 contains 50 gallons of B100.

COUNTIES INCLUDED IN THE METROPOLITAN STATISTICAL AREAS

Kansas City	**St. Louis**
1. Cass County	1. Franklin County
2. Clay County	2. Jefferson County
3. Clinton County	3. Lincoln County
4. Jackson County	4. St. Charles County
5. Lafayette County	5. St. Louis County
6. Platte County	6. St. Louis City
7. Ray County	7. Warren County

MISSOURI DEPARTMENT OF NATURAL RESOURCES

ENERGY CENTER

REPORTING AGENCY		PAGE NUMBER
REPORTING PERIOD **2002 Fiscal Year**	PREPARED BY	
LOCATION/PHONE		DATE PREPARED

WORKSHEET 3 - MISSOURI STATE FLEET - WRITTEN DESCRIPTION (OPTIONAL)

In addition to computational data, what other information could potentially improve state fleet operations? Please share your lessons learned with other fleet managers by providing a written description in the space provided below.

All written descriptions will be reviewed and, when possible, included in the next annual state fleet report. Topics of special interest include alternative fuel vehicles, alternative fuels, hybrid vehicles, vehicle fuel efficiency and fleet planning.

If you need more space, please continue on the back.